

chapter 1

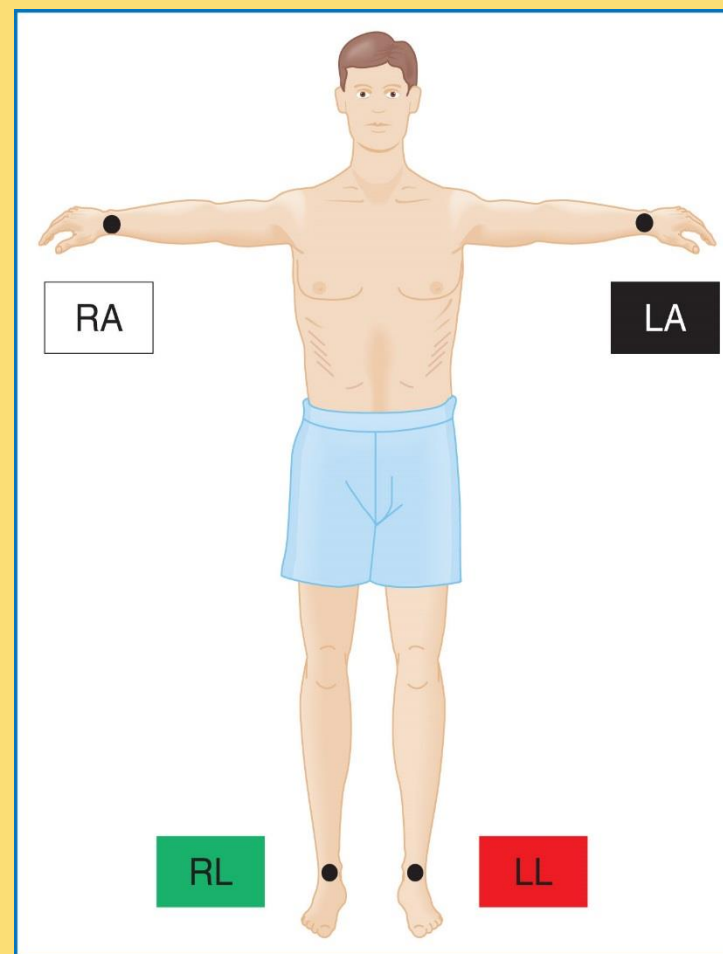
Lead Placement and Acquisition of the 12-Lead Electrocardiogram

Chapter 1 Objectives

- Differentiate bipolar and unipolar limb leads and precordial leads
- Describe the lead placement for a 12-lead electrocardiogram
- Describe the procedure for 12-lead acquisition
- Describe the procedure for multi-lead acquisition using a 3-lead bipolar machine

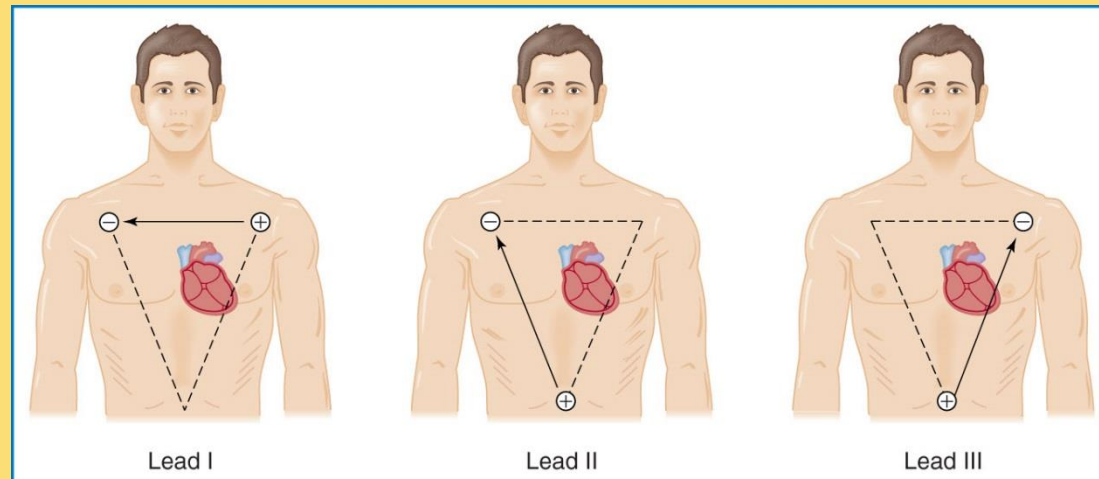
Electrodes – Limb Leads

- RA – Right arm
- LA – Left arm
- LL – Left leg
- RL – Right Leg



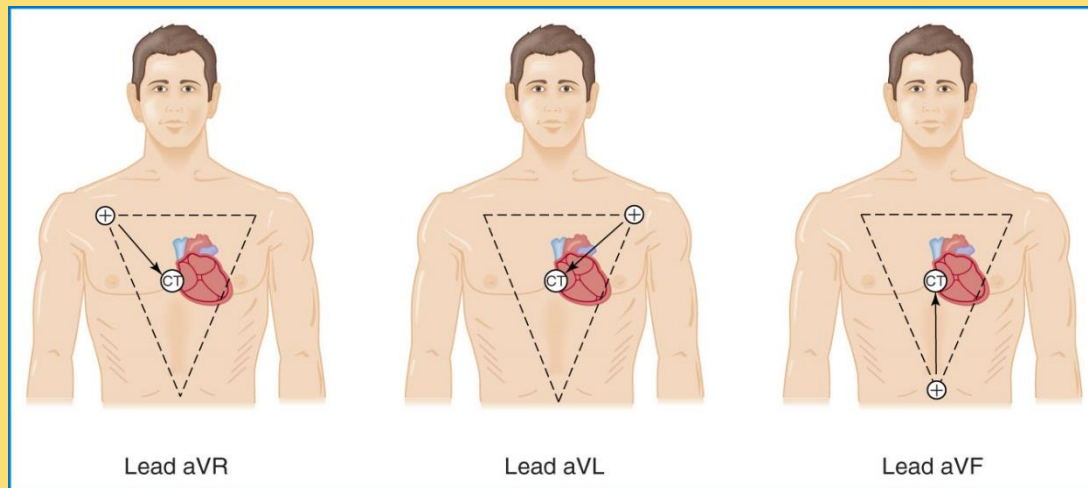
Bipolar Limb Leads

- Two electrodes
- Positive and negative
- Positive “looks toward negative”
- Einthoven’s Triangle



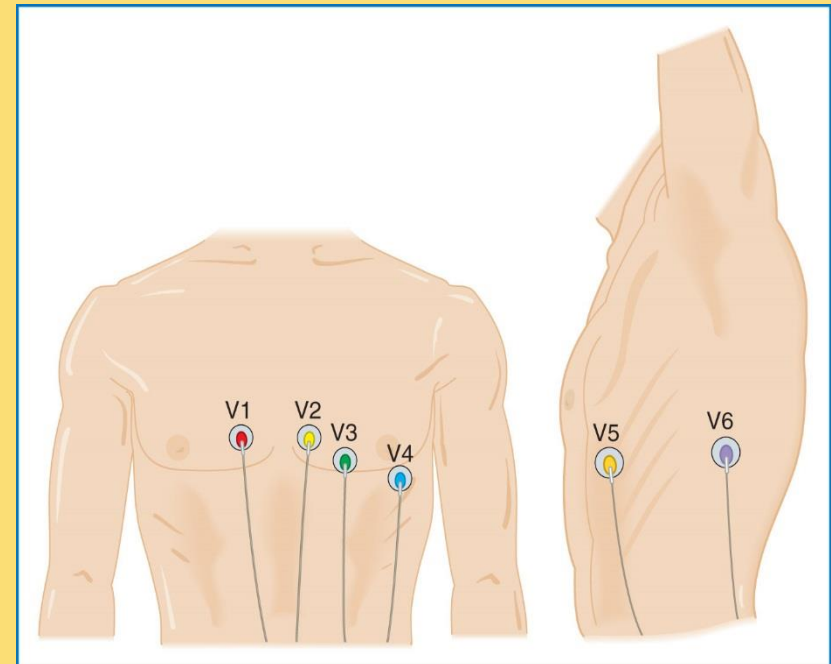
Unipolar Limb Leads

- Augmented by signal averaged CT
- aVR - right arm positive
- aVL - left arm positive
- aVF - left leg positive

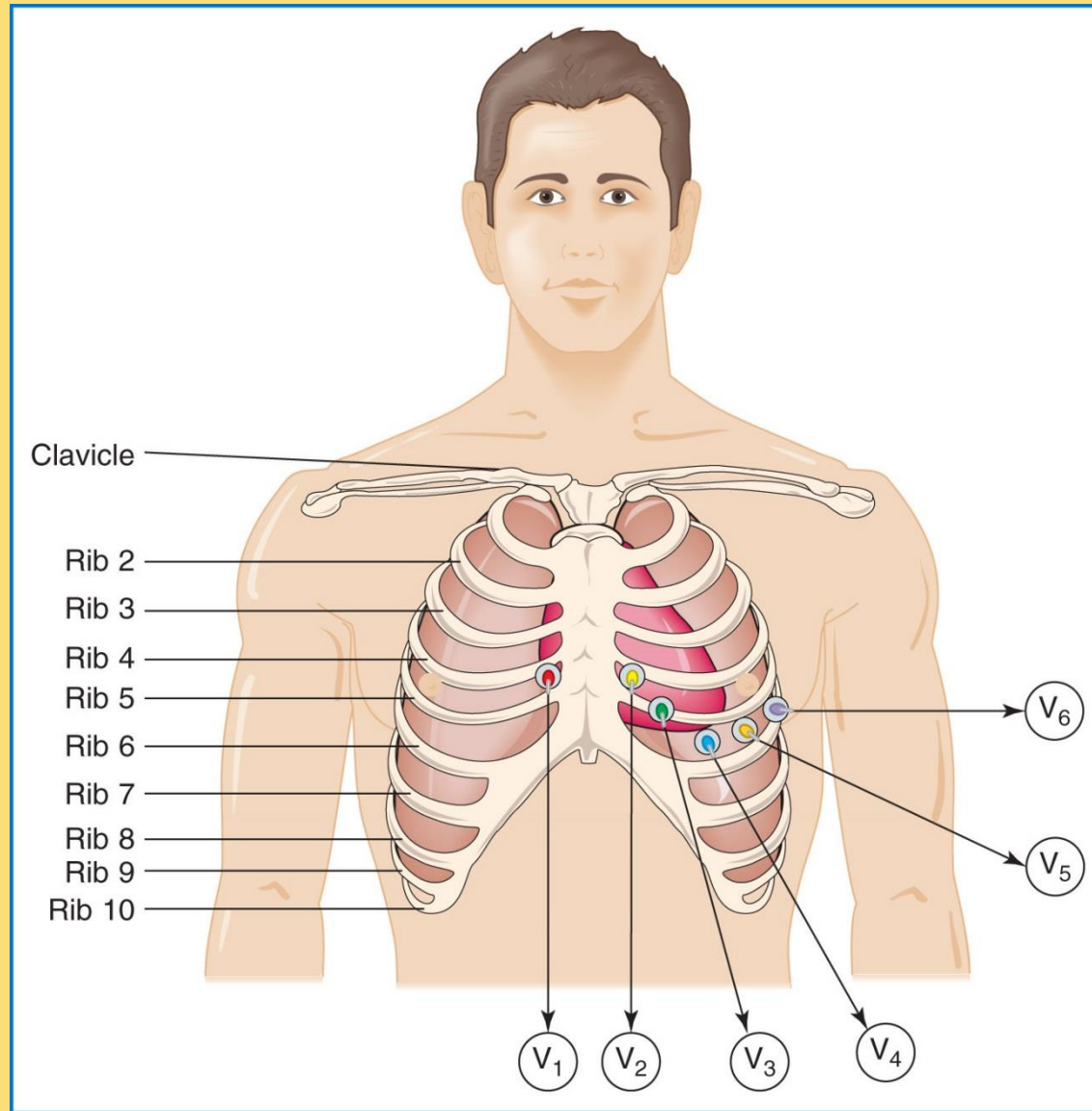


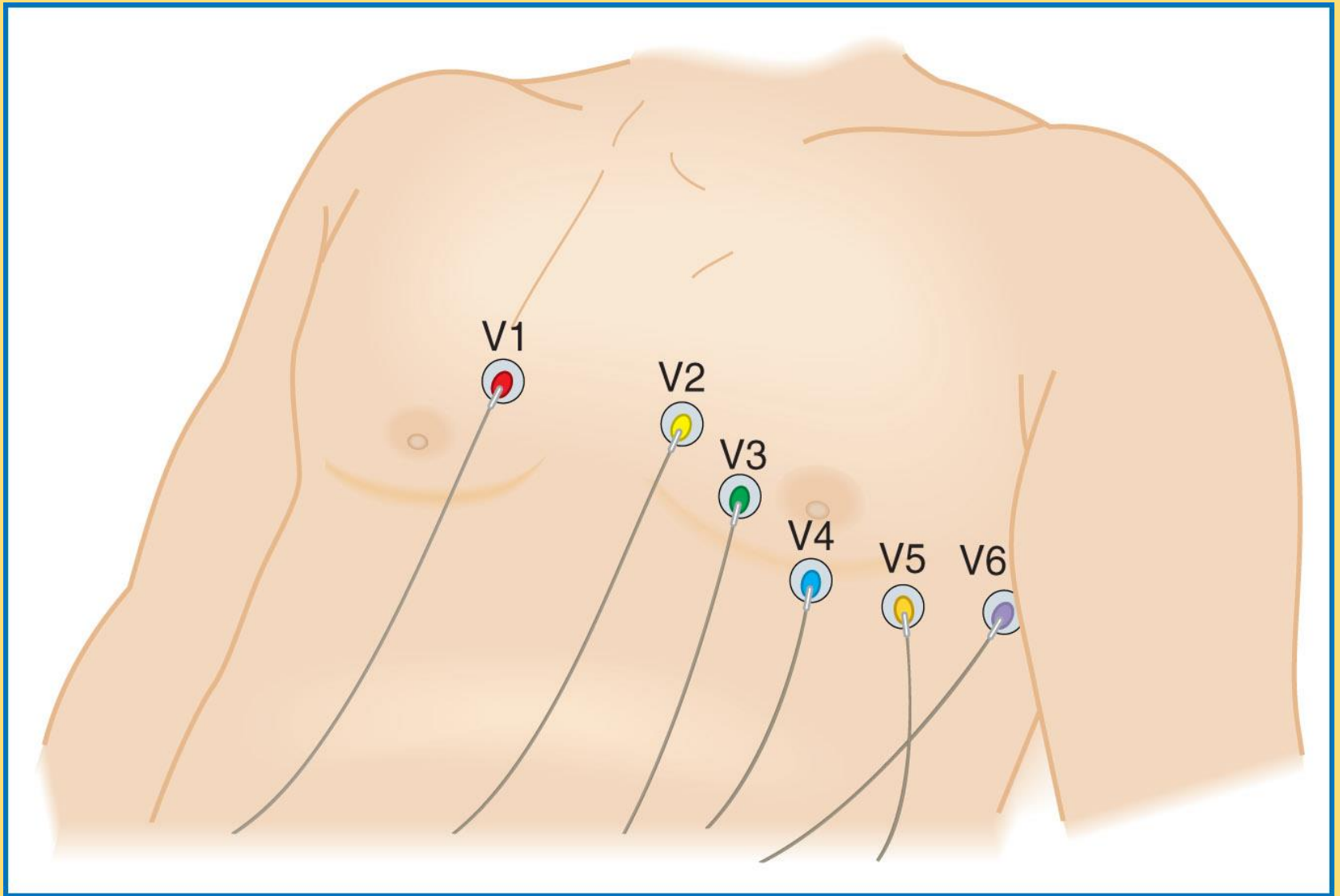
Precordial Leads

- Unipolar
- V1–V6
- Placement is based on anatomical landmark

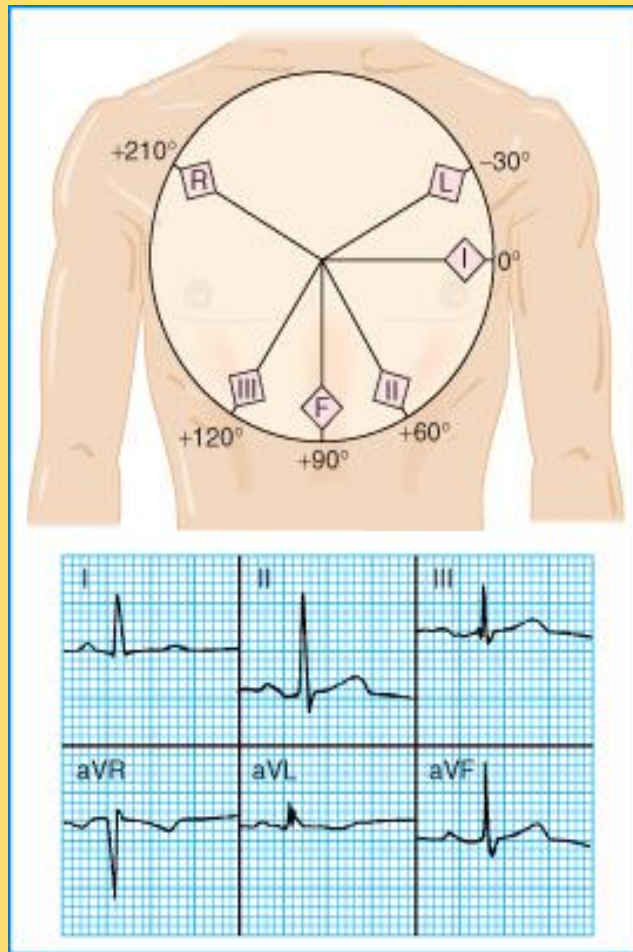


Precordial Leads





Hexaxial System



- Traditional method
- 6 limb leads at various angles
- Somewhat tedious and difficult to master

Using the 12-Lead

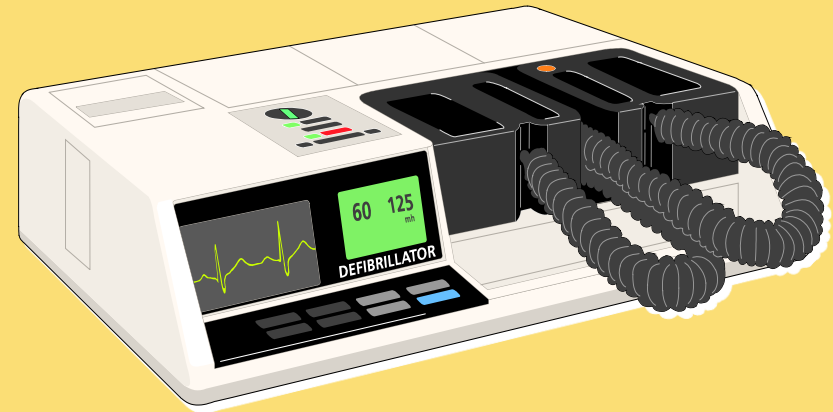
- Skin prep is important
- Dry wet skin
- Shave or clip chest hair
- Gently abrade dead skin

Poor Signal Quality?

- Proper skin preparation
- Minimize patient movement
- Move limb leads proximally
- Override the ECG to force print
- Hold the patient's arms

Standard 3- or 4-Lead Monitor

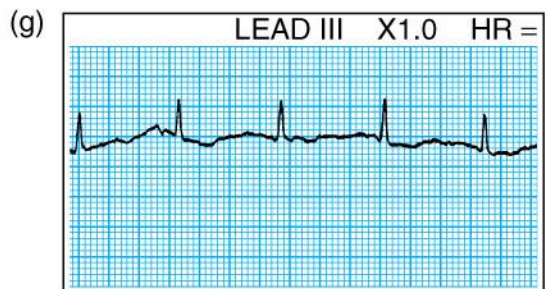
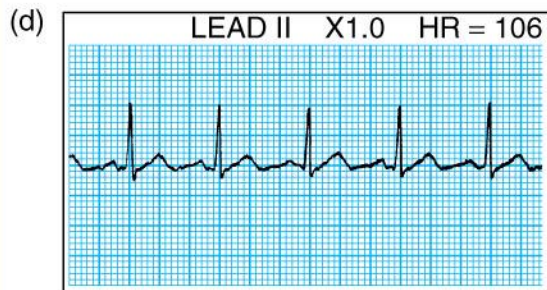
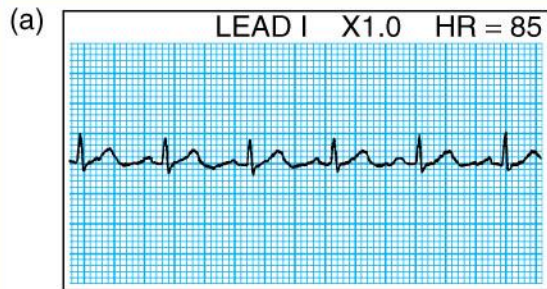
- Can be used for “modified chest leads”
- Offers advantages for lead II monitoring
- Acquires a multi-lead ECG



Getting the Multi-Lead ECG

- Run Leads I, II, and III using lead select
- Leave in Lead III on the lead select
- Move the red (LL) electrode to the V₁ position
- This is Lead MCL-1
- Move to each position (V₂–V₆) in succession

Multi-Lead ECG (9-Lead)



Time to Play!

- Practice hooking up and running 12-leads on each other
- Practice finding the landmarks
- Run at least one 12-lead every class day
- You should be able to get one in less than 2 minutes